

8/12/99

**MEMORANDUM**

SUBJECT: **Ethyl parathion.** List A Reregistration Case 0155. PC Code 057501. **Product Chemistry Chapter for the Reregistration Eligibility Decision [RED] Document.** DP Barcode 258394.

FROM: K. Dockter, Chemist  
Reregistration Branch 2  
Health Effects Division [7509C]

THRU: Alan Nielsen, Branch Senior Scientist  
Reregistration Branch 2  
Health Effects Division [7509C]

TO: Richard F. Griffin, Risk Assessor  
Reregistration Branch 2  
Health Effects Division [7509C]

Attached is the RED product chemistry chapter for ethyl parathion [O,O-diethyl O-p-nitrophenyl phosphorothioate]. This chapter was assembled by Dynamac Corporation under supervision of HED. The data assessment has undergone secondary review in the Branch and has been revised to reflect Agency policies. One product chemistry data requirement remains outstanding, namely, 830.7050; UV/Visible spectra are required.

Attachment: Reregistration Eligibility Decision: Product Chemistry Considerations

cc: Reg. Std. File, SF, RF, Dockter, D. Deziel; SRRD.  
RD\I RRB2 Ethyl parathion RED Team: R. Griffin [The TL], N. Paquette, B. Cropp-Kohlligian,  
J. Becker.

7509C:RRB2:Rm712N:57886:KD/kd  
ETHYL PARATHION.RED [916f + dyn]

# ETHYL PARATHION

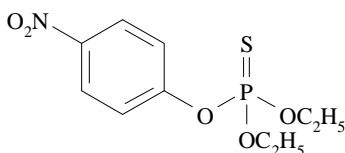
## REREGISTRATION ELIGIBILITY DECISION:

### PRODUCT CHEMISTRY CONSIDERATIONS

PC Code 057501; Case No. 0155

#### DESCRIPTION OF CHEMICAL

Parathion [O,O-diethyl O-*p*-nitrophenyl phosphorothioate] is an insecticide registered for use on alfalfa, barley, corn, cotton, rape seed, sorghum, soybean, sunflower, and wheat.



Empirical Formula:	C <sub>10</sub> H <sub>14</sub> NO <sub>5</sub> PS
Molecular Weight:	291.26
CAS Registry No.:	56-38-2
PC Code:	057501

#### IDENTIFICATION OF ACTIVE INGREDIENT

Pure ethyl parathion is a pale yellow liquid with a boiling point of 157-162 C. Technical ethyl parathion is an amber to dark brown liquid with a boiling point of 113 C. Ethyl parathion is practically insoluble in water (24 ppm at 25 C) but is readily soluble (miscible) in most organic solvents including dichloromethane, 2-propanol, toluene, acetone, ethanol, and n-hexane. Ethyl parathion is stable under neutral or acidic conditions, but hydrolyzes under alkaline conditions to form O,O-diethyl phosphorothioic acid and 4-nitrophenol, and slowly isomerizes on heating to O,S-diethyl-O-*p*-nitrophenylphosphorothioate.

#### MANUFACTURING-USE PRODUCTS

A search of the Reference Files System (REFS) conducted 2/24/98 identified a single ethyl parathion manufacturing-use product (MP) registered under PC Code 057501: the Cheminova Agro A/S 98% technical product (T; EPA Reg. No. 4787-17). The REFS status was unchanged as of 7/27/99. Under the terms of an Agreement in Principle between EPA and the registrants of parathion (Federal Register, Vol. 56, No. 240, dated 12/13/91), this product is a replacement for the 98% T (EPA Reg. No. 4787-3) which was voluntarily canceled by Cheminova. According to the agreement, any data submitted for EPA Reg. No. 4787-3 are applicable to the data

requirements for EPA Reg. No. 4787-17. Only the Cheminova 98% T is subject to a reregistration eligibility decision; all other previously registered ethyl parathion MPs have been canceled.

## REGULATORY BACKGROUND

The Parathion Guidance Document dated 12/15/86 required additional generic and product-specific product chemistry data for the Cheminova technical. The Parathion Reregistration Standard Update dated 8/17/93 reviewed data submitted in response to the Guidance Document and summarized the available database in support of the reregistration of ethyl parathion. Additional product chemistry data were required for OPPTS 830.1550, 830.6314, 830.6315, 830.6316, 830.6317, 830.6319, 830.6320, 830.7100, and 830.7370 for the Cheminova 98% T.

Adequate information has been submitted concerning the potential for formation of chlorinated dibenzo-p-dioxins and dibenzofurans during the manufacture of ethyl parathion. The Agency has concluded that analytical data on halogenated dibenzo-p-dioxin/dibenzofuran contaminants in technical ethyl parathion are not required (CBRS No. 6118, 2/23/90, S. Funk).

The current status of the product chemistry data requirements for the ethyl parathion manufacturing-use product is presented in the attached data summary table. Refer to this table for a listing of the outstanding product chemistry data requirements.

## CONCLUSIONS

Most pertinent data requirements are satisfied for the Cheminova 98% T; additional data are required concerning UV/visible absorption (OPPTS 830.7050). Provided that the registrant submits the data required in the attached data summary table for the 98% T, and either certifies that the suppliers of beginning materials and the manufacturing process for the ethyl parathion technical product have not changed since the last comprehensive product chemistry review or submits a complete updated product chemistry data package, CBRS has no objections to the reregistration of ethyl parathion with respect to product chemistry data requirements.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

CBRS No(s).: 3281  
Subject: Ethyl Parathion - Technical - EPA Registration No. 4787-3 - Cheminova -  
Response to the Product Chemistry Chapter.  
From: G. Makhijani  
To: D. Edwards and A. Rispin  
Dated: 3/25/88  
MRID(s): 40482501

CBRS No(s).: 3800  
Subject: Ethyl Parathion Technical - EPA Registration No. 4787-3. Cheminova -  
Response to the Product Chemistry Chapter.  
From: G. Makhijani  
To: D. Edwards and A. Rispin  
Dated: 5/25/88  
MRID(s): 40601401

CBRS No(s).: 4022  
Subject: Ethyl Parathion - Technical. EPA Registration No. 4787-3 - Cheminova -  
Response to the Product Chemistry Chapter - No Accession Number.  
From: G. Makhijani  
To: D. Edwards and A. Rispin  
Dated: 8/3/88  
MRID(s): None

CBRS No(s).: 6118  
Subject: Product Chemistry Data Review for Technical 98% Parathion to Determine  
the Potential for Halogenated Dibenzo-p-Dioxin/Dibenzofuran Formation.  
I.D. No. 4787-3. Record No. 256334  
From: S. Funk  
To: E. Feris  
Dated: 2/23/90  
MRID(s): 00033765 and 00105051

CBRS No(s): 17369  
DP Barcode(s): D227770  
Subject: Ethyl-Parathion Reregistration. Registrant's Response to the 3/14/96 Ethyl-Parathion Data Call-In (DCI) Notice.  
From: B. Cropp-Kohlligian  
To: P. Deschamp  
Date: 9/12/96  
MRID(s): None

CBRS No(s): 17879  
DP Barcode(s): D234873  
Subject: (Ethyl) Parathion  
From: Greybeard Committee  
Dated: 5/12/97  
MRID(s): None

DP Barcode(s): D237018  
Subject: Ethyl-Parathion Reregistration - Product Chemistry GLNs 830.6314, 830.6315, 830.6316, and 830.7100.  
From: K. Dockter  
To: D. Deziel  
Date: 11/23/98  
MRID(s): 44301401 and 44301402

DP Barcode(s): D243340  
Subject: Ethyl parathion Reregistration. Cheminova Agro A/S 8/16/96 Response [Series 830.1550 Data; CSF for 4787-17]. Rereg. Case # 0155, No MRID, PC Code 057501.  
From: K. Dockter  
To: N. Paquette and A. Layne/W. Sproat  
Date: 3/20/98  
MRID(s): None

DP Barcode: D245845  
Subject: Ethyl parathion; EPA Reg. No. 4787-17. PC Code 057501. List A Reregistration Case 0155. Supplemental Product Chemistry.  
From: K. Dockter  
To: D. Deziel  
Date: 5/17/99  
MRID: 44543101

## PRODUCT CHEMISTRY CITATIONS

Bibliographic citations include only MRIDs containing data which fulfill data requirements.

### References (cited):

00033765 A/S Cheminova (1980) Product Chemistry: Parathion Technical: Pr-Ch-EP-3. Includes methods AM 5 dated Oct 11, 1977, AM 7 dated Aug 1970, AM 9,1 dated Aug 21, 1979, AM 41 dated Aug 21, 1979, AM 211 dated Nov 19, 1979 and methods dated Oct 25, 1979.

(Unpublished study received Jun 12, 1980 under 4787-3; prepared in cooperation with Herning Beholderfabrik; CDL:242737-A)

00033766 A/S Cheminova (1980) Product Chemistry: Parathion Technical: Pr-Ch-EP-3. Includes methods AM 5 dated Oct 11, 1977, AM 7 dated Aug 1970, AM 9,1 dated Aug 21, 1979, AM 41 dated Aug 21, 1979 and AM211 dated Nov 19, 1979. (Unpublished study received Jun 12, 1980 under 4787-3; prepared in cooperation with Herning Beholderfabrik; CDL:242736-A)

00105051 A/S Cheminova (1982) Product Chemistry: Parathion Technical. (Unpublished study received Mar 19, 1982 under 4787-3; CDL: 247672-A)

40256802 A/S/ Cheminova (1987) Product Chemistry--Parathion Technical ...: Supplemental Information: Study No. MVF/20.05.87--EP3. Unpublished compilation. 25 p.

40482501 A/S Cheminova (1987) Product Chemistry - Parathion Technical. Unpublished supplemental study prepared in cooperation with Ministry of the Environment, National Food Institute. 43 p.

40601401 A/S Cheminova (1987) Product Chemistry--Parathion Technical ...: Supplementary Information: Pr-Ch-EP-3-conf/4/04.19.88. Unpublished study. 14 p.

44301401 Mullee, D.; Bartlett, A. (1997) Ethyl Parathion: Determination of General Physico-Chemical Properties (Oxidizing/Reducing Action and Viscosity): Lab Project Number: 545/086. Unpublished study prepared by Safepharm Labs, Ltd. 15 p.

44301402 Tremain, S.; Bartlett, A. (1997) Ethyl Parathion: Determination of Hazardous Physico-Chemical Properties (Flammability and Explodability): Lab Project Number: 545/087. Unpublished study prepared by Safepharm Labs, Ltd. 22 p.

Case No. 0155  
Chemical No. 057501

Case Name: Ethyl parathion  
Registrant: Cheminova Agro A/S  
Product(s): 98% T (EPA Reg No. 4787-17)

### PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? <sup>1</sup>	MRID Number <sup>2</sup>
830.1550	Product Identity and Disclosure of Ingredients	Y	<b>CSF 9/23/91</b> , CSF 8/16/96 <sup>3</sup>
830.1600 830.1620 830.1650	Starting Materials and Manufacturing Process	Y	00033765 <sup>4</sup> , 00105051 <sup>4</sup> , <b>40256802</b>
830.1670	Discussion of Formation of Impurities	Y	00033765 <sup>4</sup> , 00105051 <sup>4</sup>
830.1700	Preliminary Analysis	Y	40482501 <sup>5</sup>
830.1750	Certification of Ingredient Limits	Y	40482501 <sup>5</sup> , <b>CSF 9/23/91</b>
830.1800	Analytical Methods to Verify the Certified Limits	Y	40482501 <sup>5</sup> , 40601401 <sup>6</sup>
830.6302	Color	Y	<u>00033766</u>
830.6303	Physical State	Y	<u>00033766</u>
830.6304	Odor	Y	<u>00033766</u>
830.6313	Stability	Y	<u>00033766</u> , <b>40256801</b>
830.6314	Oxidation/Reduction	Y	44301401 <sup>7</sup>
830.6315	Flammability	Y	44301402 <sup>7</sup>
830.6316	Explosibility	Y	44301402 <sup>7</sup>
830.6317	Storage Stability	Y	44543101 <sup>8</sup>
830.6319	Miscibility	N/A <sup>9</sup>	
830.6320	Corrosion Characteristics	Y	44543101 <sup>8</sup>
830.7000	pH	N/A <sup>10</sup>	
830.7050	UV/Visible Absorption	N <sup>11</sup>	
830.7100	Viscosity	Y	44301401 <sup>7</sup>
830.7200	Melting Point/Melting Range	N/A <sup>12</sup>	
830.7220	Boiling Point/Boiling Range	Y	<u>00033766</u>
830.7300	Density/Relative Density/Bulk Density	Y	<u>00033766</u>
830.7370	Dissociation Constant in Water	N/A <sup>13</sup>	
830.7550 830.7560 830.7570	Partition Coefficient (Octanol/Water)	Y	<u>00033766</u>
830.7840 830.7860	Solubility	Y	<u>00033766</u> , <b>40256801</b>
830.7950	Vapor Pressure	Y	<u>00033766</u>

<sup>1</sup> Y = Yes; N = No; N/A = Not Applicable.

<sup>2</sup> Underlined references were reviewed in the Parathion Registration Standard Product Chemistry Chapter dated 3/25/85; **bolded** references were reviewed in the Parathion Reregistration Standard Update dated 8/17/93; all other references were reviewed as noted.

<sup>3</sup> DP Barcode D243340, 3/20/98, K. Dockter.

<sup>4</sup> References originally reviewed in the Parathion Registration Standard Product Chemistry Chapter dated 3/25/85 for reregistration were reevaluated in terms of the Dioxin DCI (CBRS No. 6118, 2/23/90, S. Funk).

<sup>5</sup> CBRS No. 3281, 3/25/88, G. Makhijani.

<sup>6</sup> CBRS No. 3800, 5/25/88, G. Makhijani.

<sup>7</sup> D237018, 11/27/98, K. Dockter

<sup>8</sup> D245845, 5/17/99, K. Dockter

<sup>9</sup> Data requirement waived by Greybeard Committee; CBRS No. 17879, D234873, 5/12/97.

<sup>10</sup> Data are not required because the T/TGAI is not soluble in water.

<sup>11</sup> The OPPTS Series 830, Product Properties Test Guidelines require data pertaining to UV/visible absorption for the PAI.

<sup>12</sup> Data are not required because the TGAI is a liquid at room temperature.

<sup>13</sup> Data are not required because the TGAI is practically insoluble in water (CBRS No. 17369, D227770, 9/12/96, B. Cropp-Kohlligian).